

## REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the following remarks.

Claims 2, 3, and 5 stand withdrawn as being directed toward non-elected subject matter.

Claims 1, 4, 6, and 8 stand rejected, under 35 USC §103(a), as being unpatentable over Daoud (US 4,835,791) in view of Muzzi (US 3,628,155). The Applicants respectfully traverse these rejections as follows.

Claim 1 defines:

*A modulation apparatus comprising:  
a first frequency-increasing single side band (SSB) modulator that performs SSB modulation on a first input symbol to obtain an upper side band (USB) signal;  
a second frequency-increasing SSB modulator that performs the SSB modulation on a second input symbol to obtain a lower side band (LSB) signal; and  
a combiner that combines the USB signal and the LSB signal,  
wherein the second frequency-increasing SSB modulator performs SSB modulation to obtain the LSB signal using a carrier frequency, the carrier frequency being higher than a carrier frequency used in the first frequency-increasing SSB modulator by a fundamental frequency of the first input symbol and the second input symbol, such that the LSB signal and the USB signal are multiplexed in the same frequency band.*

Thus, claim 1 provides a modulation apparatus that performs single side band (SSB) modulation to obtain a lower side band (LSB) signal using a carrier frequency that is higher, by the fundamental frequency of an input symbol, than a carrier frequency that is used to obtain an upper side band (USB) signal, such that the LSB signal and USB signal are multiplexed in the same frequency band.

The Final Rejection proposes that Daoud discloses, in Fig. 2, an SSB modulator 50 that produces a USB signal and an SSB modulator 30 that produces an LSB signal (see Final

Rejection page 7, lines 1-6). For clarity of discussion, the Applicants characterize Daoud's SSB generators (i.e., the SSB modulators identified in the Final Rejection) as a USB generator and an LSB generator, in accordance with the Final Rejection's acknowledgment of the type of signal each SSB generator produces.

The Final Rejection further acknowledges that Daoud discloses, in Fig. 2 and lines 38-49 of column 4, that "the frequency of the second carrier signal  $W_{c2}$  used in the upper sideband [USB] generator is slightly higher than the frequency of the first carrier signal  $W_{c1}$  used in the lower sideband [LSB] generator" (see Final Rejection page 3, underlined text). Thus, the Final Rejection acknowledges that Daoud's USB generator uses a higher carrier frequency to generate the USB signal than the carrier frequency used by Daoud's LSB generator to generate the LSB signal.

In summary, Daoud discloses using a higher carrier frequency to generate a USB signal than that used to generate an LSB signal.

In contrast, the Applicants' claimed subject matter is directed to using a higher carrier frequency to generate an LSB signal than that used to generate a USB signal.

The Applicants respectfully submit that the misapprehension in the Final Rejection, with respect to recognizing the distinction between Applicants' claimed subject matter and Daoud's disclosure, arises from the Final Rejection's mischaracterization of the index values, 1 and 2, illustrated in Daoud's Fig. 2. Although the Final Rejection correctly characterizes Daoud's first carrier signal,  $W_{c1}$ , as having an index value of 1 and Daoud's second carrier signal,  $W_{c2}$ , as having an index value of 2 (see Final Rejection page 3, underlined text, and page 7, fourth bullet), the Final Rejection incorrectly characterizes Daoud's signal  $S_2$  as having an index value

of 1 and Daoud's signal  $S_1$  as having an index value of 2 (see page 7, lines 1-6). Due to the mischaracterization of the index values for signals  $S_1$  and  $S_2$ , the Final Rejection also mischaracterizes Daoud's USB generator as having an index of one (i.e., mischaracterizes Daoud's USB generator, associated with index value 2, as a first SSB modulator) and Daoud's LSB generator as having an index of two (i.e., mischaracterizes Daoud's LSB generator, associated with index value 1, as a second SSB modulator) (see page 7, lines 1-6). And in the context of the mischaracterization of the index values for Daoud's SSB generators, the Final Rejection mis-paraphrases Daoud's disclosure by proposing that Daoud discloses, in lines 38-49 of column 4, that the second SSB modulator generates an LSB signal using a higher carrier frequency than that used by the first SSB modulator to generate a USB signal (see page 7, fourth bullet).

However, contrary to the Final Rejection's proposal, Daoud does not reference the SSB generators (i.e., modulators, as characterized in the Final Rejection) by index values in column 4, lines 38-49. Instead, Daoud expressly discloses that "the frequency of the second carrier signal  $W_{c2}$  used in the upper sideband [USB] generator is slightly higher than the frequency of the first carrier signal  $W_{c1}$  used in the lower sideband [LSB] generator" (see Daoud col. 4, lines 38-41), as is acknowledged in the Final Rejection (see Final Rejection page 3, underlined text).

Muzzi is not cited in the Final Rejection for supplementing the teachings of Daoud with regard to the above-mentioned subject matter distinguishing Applicants' claim 1 from Daoud's disclosure.

Accordingly, the Applicants submit that the teachings of Daoud and Muzzi, even if combined as proposed in the Final Rejection, still would lack the above-noted subject matter of

claim 1 and thus these references, considered individually or in combination, do not render obvious the subject matter defined by claim 1. Claim 4 similarly recites the above-mentioned subject matter distinguishing apparatus claim 1 from the applied references, but with respect to a method. Therefore, allowance of claims 1 and 4 and all claims dependent therefrom is warranted.

In view of the above, it is submitted that this application is in condition for allowance, and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

/James Edward Ledbetter/

Date: December 29, 2010  
JEL/DWW/att

James E. Ledbetter  
Registration No. 28,732

Attorney Docket No. 009289-06101  
Dickinson Wright PLLC  
1875 Eye Street, NW, Suite 1200  
Washington, DC 20006  
Telephone: (202) 659-6966  
Facsimile: (202) 659-1559

DC 9289-6101 166104v1